



Responsible Office: Center Operations Directorate

SUBJECT: Metrology and the Control of Inspection, Measuring, and Test Equipment

1. Policy

a. It is Langley Research Center's (LaRC) policy to comply with metrology and calibration regulations, procedures and standards listed in Paragraph 3 of this directive.

b. Provide LaRC with a comprehensive metrology and calibration program that identifies the authority and responsibilities for the management of Inspection, Measuring, and Test Equipment (IM&TE), calibration related task descriptions, calibration reference standards, and calibration related software in a controlled process that assures adequate measurement confidence for the application.

c. Definitions

(1) Calibration. The set of operations which establish, under specified conditions, the relationship between values indicated by a measuring instrument or measuring system, and the corresponding standard or known values derived from the standard.

(2) Inspection, Measuring, and Test Equipment (IM&TE). All of the measuring instruments, measurement standards, and reference materials that have been identified as Category 1 (recalled for calibration prior to expiration) or Category 2 (calibrated before use) based on its application. Equipment used in the following applications must be Category 1 or 2 IM&TE: acceptance testing; inspection, maintenance, calibration, and/or qualification of flight hardware; measurement of processes where test equipment accuracy is essential for the safety of personnel or facilities; telecommunication, transmission, and test equipment where exact signal interfaces and circuit confirmations are essential to mission success; development, testing, and special applications where the specifications, end products, or data are accuracy sensitive.

2. APPLICABILITY

This LAPD is applicable to all Center organizations and to all on-site/off-site contractors to the extent specified in their contracts

3. AUTHORITY

a. ANSI/ASQ Q9001-2000, "Quality Management Systems"

b. NCSL/ANSI Z540-1-1994, "American National Standard for Calibration Laboratories and Measuring and Test Equipment-General Requirements" or ISO/IEC 17025:2000, "General Requirements for the Competence of Testing and Calibration Laboratories"

c. NPD 8730.1, "Metrology and Calibration"

4. REFERENCES

a. LMS-CP-0506, "Selection, Use, and Control of Inspection, Measuring and Test Equipment (IM&TE)"

b. LMS-CP-0510, "Procurement of Inspection, Measuring, and Test Equipment"

5. RESPONSIBILITY

a. The Center Director is responsible for:

(1) Implementation and oversight of NPD 8730.1.

(2) Assuring formal representation to the NASA Metrology and Calibration Working Group (MCWG), workshops, and other related activities to address Agency-wide metrology issues

b. The Director of the Center Operations Directorate is responsible for:

(1) Implementation and oversight of LAPD 8730.1.

(2) Appointing the LaRC Metrology Officer that will represent LaRC on the NASA MCWG.

(3) Sponsoring the LaRC MCWG.

(4) Determining which Organizational Units will be represented at the LaRC MCWG.

c. Organizational Unit Managers (OUM's) shall:

(1) Recommend and appoint Organizational Unit level Metrology Officers who will attend the LaRC MCWG meetings.

d. Branch Managers shall:

(1) Select Metrology Representatives (MetReps) if branch activities require the use of calibrated equipment and notify the LaRC Metrology Officer via e-mail of selection.

NOTE: Assignment of contractor as MetRep must be agreed to by Office of Procurement, Contracting Officer's Technical Representative (COTR), and contractor management.

(2) Identify Designated Users for all Category 1 and 2 IM&TE, and notify MetRep to update LaRC Metrology Information System (MIS).

e. The LaRC Metrology Officer shall:

(1) Represent LaRC at Agency mandated (NPD 8730.1) annual NASA MCWG.

(2) Schedule and chair meetings of the LaRC MCWG.

(3) Assure that proper metrology related procedures are established and work with the LaRC MCWG to assure implementation of and compliance with those procedures.

(4) Advise Office of Procurement on content of any statement of work related to LaRC contracts that involve calibration laboratory services.

(5) Serve as NASA Responsible Official for MIS.

(6) Train new MetReps, add new names to the MIS MetRep master list, remove former MetReps from master list, provide passwords to allow changes to the MIS, and transfer equipment to new MetReps

f. The Metrology Representative shall:

(1) Act as focal point of metrology in the branch and work with IM&TE Designated Users to resolve metrology issues and attend annual metrology work shop hosted by the LaRC MCWG.

(2) Work with branch management to assign a Designated User to all Category 1 and 2 IM&TE in the MIS database and ensure that Designated Users are aware of their responsibilities.

(3) Be familiar with LMS-CP-0506, "Selection, Use, and Control of Inspection, Measuring and Test Equipment (IM&TE)," and LMS-CP-0510, "Procurement of Inspection, Measuring, and Test Equipment," and work with the LaRC Metrology Officer to resolve metrology issues.

(4) Assist the Designated User with inputting new or changing current IM&TE information into the MIS data base.

(5) Maintain (using MIS) an up-to-date listing of all Category 1 and 2 IM&TE in the branch, and assist the Designated User with resolving and documenting issues concerning inability to respond to calibration recall notices and out-of-tolerance notifications by adding notes in the MIS.

(6) Work with Designated User to perform annual inventory of all Category 1 and 2 IM&TE assigned, and update MIS with changes as needed. Excessed items shall be changed to Category "E" in the MIS data base (records are retained); follow property management regulations for disposition

g. The LaRC Metrology and Calibration Working Group shall:

(1) Meet quarterly to establish and review metrology and calibration policy and identify noncompliance issues at LaRC including: failure to calibrate Category 1 or Category 2 IM&TE that is in use, improper calibration interval adjustment, lack of stated uncertainty requirements, and task descriptions related to calibration that are incomplete and other matters pertaining to metrology issues.

(2) Work with MetReps in their organizations to assure compliance with all relevant Center procedures to effectively implement the Center metrology program.

(3) Work with OUM's and branch heads as needed to resolve significant metrology related noncompliance issues and assist in securing adequate funding for required calibration activities.

(4) Investigate/develop control techniques and measures to assure a cost effective, efficient and reliable metrology program.

(5) Establish surveillance and monitoring requirements of LaRC metrology activities to assure quality.

(6) If significant non-compliance issues cannot be resolved by this group, then it is the responsibility of the LaRC Metrology Officer to inform the Director of Center Operations Directorate and request assistance in resolution of the non-compliance issue.

h. Designated Users shall:

(1) Select (or approve) IM&TE for use that has adequate uncertainty to meet the uncertainty requirements of the application.

(2) Determine if IM&TE should be Category 1 or 2 (see LMS-CP-0506).

(3) Identify and document Category 1 or 2 IM&TE used in test (see LMS-CP-0506, Note 2).

(4) Initiate requests for calibration that include specific requirements, review calibration results to confirm requirements were achieved and that IM&TE labeling and MIS records are correct.

(5) Document (in MIS notes by contacting the MetRep) justification for using IM&TE beyond the recommended calibration interval; data taken after interval expiration is considered non-compliant until the IM&TE is proven to be in tolerance when post calibration is performed.

(6) Evaluate IM&TE out of tolerance conditions when notified and document the impact on testing in MIS notes by contacting the MetRep.

6. DELEGATION OF AUTHORITY

None

7. MEASUREMENTS

None

8. CANCELLATION

None

Original signed on file

Lesa B. Roe
Center Director